

Blast from the past

An important piece of Apollo training hardware is returning to JSC after a 12-year absence. Story on Page 3.



Flowers for flight

A Bedford, Texas, family reveals its reasons for sending roses to Mission Control during recent missions. Story on Page 4.

Space News Roundup

Vol. 28

July 7, 1989

No. 27

Columbia returns to operational processing flow

Crews mate orbiter to external tank, solid rocket boosters; prepare for roll out

By Kyle Herring

The first space shuttle to orbit the Earth—*Columbia*—was towed from its hangar in the Orbiter Processing Facility to the Vehicle Assembly Building early this week in preparation for its return to flight on the 30th shuttle mission.

With the roll out from the hangar shortly after midnight Monday, NASA reached a significant milestone: the first time since 1986 that NASA has had three operational space shuttles in the

launch processing flow for upcoming missions.

By 4 p.m. Tuesday, the orbiter was mated to its external tank and solid rocket booster stack atop the mobile launch platform in VAB high bay 3. Work under way this week includes connecting the tail service masts to the orbiter.

Access stands are being assembled for tile technicians. Step and gap

measurements will be taken around the nose of the orbiter, gap fillers will be installed in various areas and necessary tile repairs will be made.

The interface verification tests began during second shift Thursday evening. The purpose of the IVT is to verify all critical connections between the orbiter and the tank, orbiter and boosters, orbiter and mobile launch

platform and to perform a functional operational check of the solid rocket booster systems.

Columbia's roll out to launch complex 39B for a Department of Defense-dedicated flight is currently targeted to begin no earlier than 11:01 p.m., Monday, July 10.

In the Orbiter Maintenance and Refurbishment Facility, workers are preparing the orbiter *Discovery* for its move to the processing facility vacated by *Columbia*. *Discovery* will Please see **STS-28**, Page 4



measurements will

connections between the orbiter and boosters, orbiter and mobile launch



NASA Photo by Jack Jacob

LIGHTS, CAMERAS, MISSION!—The crew of STS-28 checks out some of the camera equipment it will be taking into orbit during a recent bench review. Mission Specialist Mark Brown, left, prepares to look at the video camcorder as Pilot Dick Richards, technician Don Carico, and Mission Specialists Dave Leestma and Jim Adamson look on. Commander Brewster Shaw, right, inspects one of the 35mm lenses that will be used.

Homecoming parade, rally enlisting stars

By Linda Copley

Plans are well under way to make the July 22 JSC Homecoming Parade and Rally a celebration not soon to be forgotten.

The main gate will open at 8 a.m. to allow all spectators, both employee and public, to line up early along the parade route, which will begin at 9:30 a.m. at the Gilruth Recreation Center. The spectacle of floats, bands, and dignitaries will then wind its way through the center, past the judges' stand outside Bldg. 1, ending up at the rally site in Rocket Park at 11:30.

The parade and rally will be televised by Channel 11 and broadcast live by most of the five participating local radio stations. Apollo 11's Buzz Aldrin will serve as grand marshal, and 13 additional Apollo astronauts will be there as well. Rep. Mike Andrews is participating, as well as Mayor Kathy Whitmire of Houston and the mayors of El Lago, Kemah, Seabrook, League City, Webster, and Pasadena.

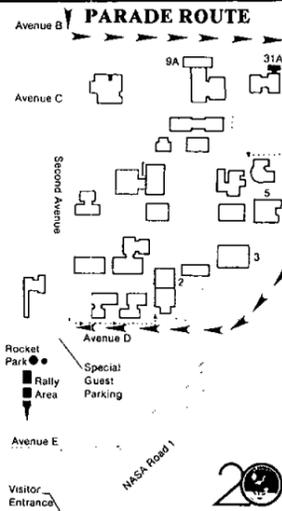
To date, parade planner Celeste

Wilson has signed up five cast members from "Star Trek: The Next Generation" (including Patrick Stewart, who plays Captain Picard, and LeVar Burton, who plays chief engineer Jeordi LaForge); two large local high school bands; two color guards,

including that of Texas A&M; representatives from the Alabama-Coushatta Indian tribe; and 30 cars and 15 floats, with more entries expected and encouraged.

The JSC divisions are encouraged to participate in the parade with a float. The four confirmed entries include Propulsion and Power, Solar System Exploration, Advanced Programs and Mission Opera-

tions, which will feature Director Eugene Kranz at the helm of its float. Any JSC division wishing to enter should contact Marilyn Davidson at 282-1909. The JSC contractors are represented so far in the float category by Rockwell, Martin Marietta, McDonnell Douglas, Omniplan, and Krug International. Any contractor wishing more Please see **PARADE**, Page 4



Space station experiments picked

NASA's Office of Space Science and Applications has selected 27 flight experiments, or concept studies leading to experiments, that will fly aboard the Space Station *Freedom*.

The selections fall into two categories. The flight category is for attached scientific experiments that can be mounted aboard elements of *Freedom's* structure during its assembly and outfitting phase. The 14 investigations selected in this category will be the first performed aboard *Freedom*.



Flight proposals were solicited that would be limited in weight and make only modest demands on station resources, such as power, cooling and crew availability, during the busy assembly phase.

The concept study category is for

studies that may lead to flight experiments after the assembly phase. These proposals were solicited for more advanced ideas that could be implemented after station assembly when additional resources, such as higher power and data-handling capabilities, will be available.

Some of the 14 flight experiments and 13 concept studies call upon two facilities the Office of Space Science and Applications has indicated would Please see **EXPERIMENTS**, Page 4

Memories most can only imagine

Apollo astronauts to share mission experiences

By Jeff Carr

From the Sea of Tranquility to the plains of Hadley and the narrow valley of Taurus-Littrow, 12 American astronauts have strolled the terrain of our closest planetary companion, toting the precious necessities of life on their backs as they sampled, charted, and explored the surface of the Moon.

The crews of Apollo stayed nearly 300 hours on the Moon with more than 81 hours of that time spent outside their spacecraft. The lunar explorers walked, hopped, and drove a "moon buggy" over the stark lunar landscape at distances up to four and a half miles from their landing sites, covering almost a hundred linear miles. Command module pilots, representing their ticket home, orbited overhead, racking up nearly 600 hours in lunar orbit.

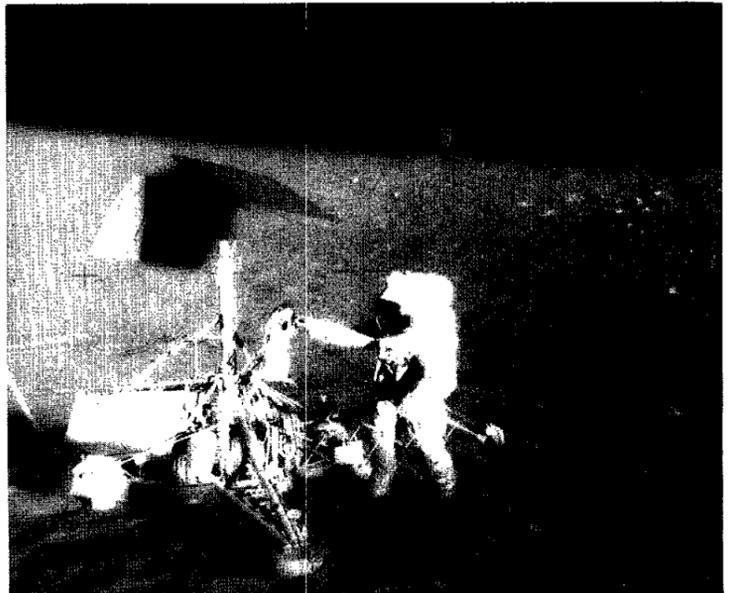
These few American astronauts hold memories of an experience that most of us can only imagine. What we can see only in photographs and through powerful lenses, or learn of in books and maps, they once encountered in a very personal way. They were there.

On July 21, in the Teague Auditorium, the flight crews of Apollo will meet and reminisce in a special anniversary event, "The Moon as Seen by the Apollo Astronauts." From the first manned orbital demonstration flight to the final lunar landing, each Apollo crew will be represented in this first-hand account of man's greatest adventure.

Featuring a variety of color slides and the impressions of the men who took them, this historic program will consist of a chronology of the Apollo missions, led by Apollo 9 command pilot and Apollo program manager James A. McDivitt, and the personal recollections of the astronauts themselves.

Compared to previous astronaut reunions, Apollo 12 lunar module pilot Alan Bean sees the anniversary event as unique. "It's going to be an interesting time, to see what one another think after 20 years. "Visions and memories change as the years roll by."

Bean, with crew commander Pete Conrad, piloted the lunar module "Yankee Clipper" to a landing on the eastern fringe of the Ocean of Storms, spent nearly eight Please see **MOON**, Page 4



NASA Photo

Apollo 12 Astronaut Charles Conrad Jr. stands with the Surveyor III lunar probe on the surface of the Moon.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays: FBA cards are still available to civil service employees at Bldg. 11 store.

General Cinema (valid for one year): \$3.50 each.
 AMC Theater (valid until May 1990): \$3 each.
 Sea-Arama Marineworld (Galveston, valid until Aug. 17, 1990): adults, \$8.75; children \$5.50.
 Sea World (San Antonio, year long): adults, \$17.25; children \$14.75.
 Palm Beach at Moody Gardens (valid until September 1989): adults \$2.75; children \$1.50.
 Astroworld (valid 1989): adults, \$14.12; children under 4, \$11.99; season pass, \$32.36; Waterworld (valid 1989): \$8.15.
 Six Flags (valid 1989): \$14.12.
 River Raft Trip (July 15): \$30.
 Overnight River Raft Trip (July 15-16): \$72.
 Shaw Festival Theatre Productions (UHCL-"Misalliance" and "Widower's Houses"): adults, \$6; children, \$3; seniors, \$3.
 Houston Astros vs. Philadelphia Phillies (July 21, 7:35 p.m., Astrodome): field level seats available through today, \$7.

JSC

Gilruth Center News

Sign up policy—All classes and athletic activities are first come, first served. To enroll, you must sign up in person at the Gilruth. Everyone will be required to show a badge or EAA membership card. Payment must be made in full at the time of registration. Classes usually fill up four weeks in advance.

EAA badges—Dependents and spouses may apply for a picture I.D. 6:30-9:30 p.m. Monday-Friday.

Defensive driving—Course is offered from 8 a.m.-5 p.m., Aug. 19; cost is \$15.

Weight safety—Required for use of the Rec Center weight room. Classes will be 8-9:30 p.m. on July 12 and July 27; cost is \$4.

Aerobics and exercise—Both classes are ongoing; cost is \$24.

Tennis lessons—Beginning tennis, Mondays 5:15-6:45 p.m. Six-week course begins July 10; \$32 per person.

Scuba lessons—The course includes classroom and pool sessions, open water dive. Five-week class begins July 10; cost is \$45, plus additional fees.

Ballroom dance lessons—Professional instruction in beginning, intermediate, and advanced ballroom dancing. Classes begin Aug. 3 and meet every Thursday for eight weeks. Beginning and advanced classes meet from 7-8:30 p.m. Intermediate class meets from 8:15-9:30 p.m. Cost is \$60 per couple.

JSC

Swap Shop ads are accepted from current and retired NASA civil service employees and onsite contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in bldg. 2.

Property

Sale: 50 acres, Hallettsville rice land, unimproved, very flat, \$800/acre. 996-8410
 Sale: Galveston seawall, 1 wk. timeshare, 2 BR, 2 BA. Linda, 482-1156.
 Sale: Friendswood/Regency Estates, 4-2-2, \$96,000. Steve, 280-1114 or 482-3696.
 Sale: 60 acres, 3 mi. from Karnes City, TX., Hwy. 80, 50 mi. from San Antonio. 783-9164.
 Sale: '85 3-2, 14' x 80' mobile home. 559-1661.
 Rent: condo, 2-2-carport, \$425/mo., \$100/dep. Scott, x37663 or 996-9244.
 Sale: Taylor Lake Estates, 90' x 135' lot, \$36,500. Don, x38039 or 333-3313.
 Sale: Friendswood/Sun Meadow Estates, wooded lot, \$29,500. Doug, x32860 or 486-7412.
 Sale: Galveston Bay home, 3-3. 334-1909.
 Sale: Resada townhome, 3-2.5, \$48,500. Bob, x32193 or 332-3817.
 Sale: Cocoa Beach, FLA, time-sharing condo. Kelly, x31356 or 488-4870.
 Sale/Lease: Heritage Park, new sec., 3-2-2, \$65,000 or 12K equity and assum. 9.5 FHA. x35021 or 482-5615.
 Sale: Two lots in Lomax sec. of La Porte, \$12,000. 944-5624.
 Sale: Lake lots, Toledo Bend, \$12,000. 944-5624.
 Sale: Countryside, 3-2-2, assume 9 3/4%, \$55,000. Bob, x32193 or 332-3817.
 Lease: Univ. Trace condo, 1 BR, study, \$425 furn. or \$395 unfurn. Barbara, 282-4616.
 Sale: Heritage Park, 3-2-2, custom home, \$58,500. Tony or Lori Emmons, 482-5139.
 Trade houses: Custom canyon view, 4 BR-3B, want similar, quality, archit, near JSC. 471-8795 or 333-6083.
 Sale: 3-3-2 Exec. villa, 2,500 sq. ft., \$75,000, borders golf, near lake. 488-0500.
 Sale: League City, 2.06 acres, owner finan., 10%, \$39,900. (713) 554-6695.
 Sale/Lease: Austin/UT condo, 1-1, assume, lease, \$395/mo. J. Craig, 282-1911 or 420-2936.
 Sale: Alvin area, 3-1-1. x32251 or 331-3379.
 Lease: 3 BR, 2 BA split level, 16' x 80' mobile home, \$350/mo. 337-3122.
 Sale: Seabrook, 3.29 acres, 2 BR-1 BA, \$95,000. 532-4784.
 Sale: Friendswood, 2 lots, ea. approx. 70' x 185', owner finan. w/10% down. 482-5226.
 Rent: League City, 3-2-2, \$750/mo., avail. July, 554-6200.
 Rent: Western Heights, Alvin, 3-2-3, 1 acre, \$650/mo. 977-0223.
 Sale: Alvin/Pearland, brick 3-2-2, \$53K. 977-

0223.
 Sale: Meadowbend, 3-2-2, 10.5% assum. loan w/low equity, \$67K. 538-1267.
 Sale: Middlebrook, 3-2-2, \$89,400. x32805 or 486-1888.
 Lease: Countryside, 3-2-2, \$550/mo., \$550 sec. dep. 486-9811.
 Sale: Big Bend area, 160 acres, \$140/acre. 337-4051.
 Sale: Heritage Park, 3-2-2, 10.5% assum., \$69,500. x36619 or 996-0289.
 Sale: SW Houston, 2-story, 4 yr. old, FHA assum. 8.5%. Howard, 282-2878 or 726-9037.
 Sale: Alvin, 3-2-2A, assum. loan, \$57,900. x38456 or 388-1090.
 Rent: Lake Livingston, 3-2. 482-1582.
 Sale: Pearland, lg. 1.5 story, \$145,000. 482-6994.

Cars & Trucks

'71 Volvo 164, not running, \$300. 280-1747 or 480-3110.
 '88 Chevy S-10, ext. cab, ex. cond. Brent, 333-9281 or 334-3027.
 '86 Ford Escort, 75K mi., \$3,500. 282-3359.
 '76 Plymouth Arrow hatchback, good work car, \$600 cash, OBO. x34270 or 337-2682.
 '76 Dodge Ram 4x4, good cond., some new parts, \$3,000. George, 944-9761.
 '66 VW bug, \$2,150, OBO. Fred, 480-7172.
 '77 Custom Ford van, runs good, \$1,200, OBO. x37663 or 996-9244.
 '81 Chevy Citation, runs OK, \$950 nego. Craig, x36206.
 '82 Honda Accord, 4-dr., nice car, \$3,850. x30092 or 481-3637.
 '87 red IROC-Z, ex. cond., \$14,000. Fran or Mike, 465-3451 or 550-5053.
 '85 35' Mallard motor home, \$40,000. 337-4051.
 '67 Mustang, ex. cond. x36276 or 332-2869.
 '85 Dodge Charger, 5-spd., ex. cond., \$3,200. Laura, x36665 or 333-9733.
 '82 Ford XLT Lariat F150, \$3,200, OBO. 280-1747 or 480-3110.
 Wheel camper pop-up camp trailer, gar. kept, \$1,000. Jana, x31653 or 532-3008.

Boats & Planes

14' alum. boat, 9.9 Evin. motor, trailer, \$500. Kevin, 280-1500, ext. 3015 or 532-2181.
 '75 Bayliner 21' w/cuddy, will trade for camper trailer or \$4,900 cash. George, x34819 or 944-9761.
 20' twin eng. runabout, recon. Merc., ready to run, \$2,700. Brian, 480-5430.
 18' Hobie Cat, galv. trailer, good cond., \$1,650. x31226 or 534-3710.
 18' Falcon Cougar, 90hp Merc., Hummingbird LCR-2000. 331-8310 or 468-1696.
 '84 20' center console boat 115hp Johnson OB and trailer, \$2,200, OBO. Jon, x31709 or 922-1978.
 '85 Conroy (Glastron) X19, 19', stern drive pleasure boat, 140hp Mercruiser, ex. cond., \$6,850. Jim, 282-4029.
 '79 Renegade 1540 ski boat, 115hp Evin., \$3,800, OBO. 486-7846 or 333-6868.

JSC

Dates & Data

Today

Cafeteria menu—Special: tuna and salmon Croquette. Entrees: pork chop with yam rosette, Creole baked cod. Soup: seafood gumbo. Vegetables: Brussels sprouts, green beans, buttered corn, whipped potatoes.

Sunday

UHCL alumni party—The University of Houston-Clear Lake Alumni Association will host its third annual alumni "Band on the Lake" party from 2-7 p.m. July 9 at the terrace area of the Nassau Bay Hilton. Entertainment will be the Scott Gertner band. Admission is \$2; be sure to wear something with the UHCL logo. For more information, call 488-9222 or 333-2636.

Monday

Hurricane preparedness—Stellacom will present a 26-minute video entitled "Hurricane Preparedness Program" on closed circuit television Channel 6 daily, from noon-12:30 p.m. July 10-21.

CLAUG to meet—The Clear Lake Apple Users Group (CLAUG) will meet at 7 p.m. July 10 at the Clear Lake Park Building, 5001 NASA Road 1. For more information, contact Larry Walter, x35591 or 488-1135.

Cafeteria menu—Special: Italian cutlet. Entrees: braised beef ribs, chicken a la king, enchiladas with chili. Soup: cream of broccoli. Vegetables: navy beans, Brussels sprouts, whipped potatoes.

Tuesday

Cafeteria menu—Special: stuffed cabbage. Entrees: turkey and dressing, round steak with hash browns. Soup: beef and barley. Vegetables: corn cobbette, okra and tomatoes, French beans.

Wednesday

Cafeteria menu—Special: pepper

steak. Entrees: catfish with hush puppies, roast pork with dressing. Soup: seafood gumbo. Vegetables: broccoli, macaroni and cheese, stewed tomatoes.

Thursday

Cafeteria menu—Special: chicken fried steak. Entrees: beef tacos, barbecue ham steak, Hungarian goulash. Soup: turkey and vegetable. Vegetables: spinach, pinto beans, beets.

July 14

Cafeteria menu—Special: tuna and noodle casserole. Entrees: liver and onions, deviled crabs, roast beef with dressing. Soup: seafood gumbo. Vegetables: whipped potatoes, peas, cauliflower.

July 15

Lunar Rendezvous 5K race—The 11th annual Lunar Rendezvous 5K Space Race and 2-mile Fun Walk will begin at 8 a.m. July 15 at the Gilruth Recreation Center. Entry fee is \$10, with proceeds benefitting local charities. Entry forms are available at the Rec Center gym office. Those interested in volunteering for the race should contact Len Topolski at 333-5576.

Spaceweek stargazing—The JSC Astronomical Society and Challenger Memorial Park will sponsor an opportunity to view the Moon and planets through telescopes provided by local amateur astronomers. The event will be from 8-10 p.m. July 15, weather permitting, at Challenger Memorial Park, 2301 W. NASA Rd. 1 and is free of charge. For more information, contact Bill Williams, 339-1367 (evenings).

July 17

Lunar exploration film—"For All Mankind," Al Reinhardt's 90-minute feature film on manned lunar explo-

ration will be shown daily during the week of July 17-23 in Teague Auditorium. The film will be featured from 3-4:30 p.m. July 17-21; 7:30-9 p.m. July 17 and 21; and during the JSC Open House on July 22-23 at scheduled times to be posted in Bldg. 2 each day.

Speakers program—"The Moon Before Apollo" will be presented from 11 a.m.-2 p.m. July 17 in Teague Auditorium. Concepts about the origin, evolution, and composition of the Moon as well as the unmanned precursor missions will be discussed, and the program is free and open to the public. Contact x38613 for more information.

MOD hospitality suite—The Mission Operations Directorate hospitality suite will be open to MOD employees from 7-11 p.m. July 17 at Kings Inn on NASA Road 1.

Boeing facility tours—Boeing facility guided public tours of the flight processing facility will be held at 2 p.m. daily, July 17-21. Contact Julia Sorrels, 280-2023, for reservations.

July 18

Speakers program—"Planning the Apollo Missions" will be presented from 11 a.m.-2 p.m. July 18 in Teague Auditorium. Mission operations, communications, guidance, software, propulsion, thermal protection and landing dynamics will be discussed by key project engineers, and the program is free and open to the public. Contact x38613 for more information.

Recovery hospitality suite—The Landing and Recovery Division hospitality suite will be open all day June 18 at the Kings Inn, 1301 NASA Rd. 1. Contact Charles Filley, 333-3919 for more information.

Swap Shop

King size waterbed w/lighted headboard; white 4-burner cooktop; white 27" built-in oven; white 36" vent hood, BO. Mark, x31924 or 326-2251.

Glass table w/4 chairs, ex. cond., \$150. 331-3379.

Casual 3-pc. sofa sect., solid oak trim, recliners on each end, incl. oak top corner table, \$400; five 31" white vinyl blinds, one 34" white vinyl blind, \$4.00/ea. Dave, x32914 or 554-5522.

Queen Anne table, 36" x 60" w/leaf, \$130; Queen Ann chair, \$35. Sandra, x37639 or (409) 925-7765.

Pets & Livestock

Free 6 yr. old male Spitz to good home, loveable, likes older kids and adults. Rose, 282-3025.

Wanted

Want three-wheel baby jogging stroller in good cond. Laurie, x33748 or David, 282-1874.

Want Volvo 15" Turbo wheel, 5 spokes in good cond. Vincent, x30874 or 333-1316.

College students want to rent a 3 plus BR house in Rice/Med. Cen./W. Univ. area, starting in Aug. Martha, x35111 or 488-4026.

Want to rent house w/3 acres plus League City/CL, Alvin area. Shirley/Denae, x38619 or 332-6769.

Want 2 tickets to 20th Anniv. gala. Anna, x34117 or 995-6009.

Want oscilloscope, med. to high freq. John, x31381.

Want clean old low mi Ford car or PU. Jim, 486-3917.

Want unwanted or undesired items, anything of value. 333-6558 or 339-1337.

Want vocalist for the Contraband Swing Band, 20-pc., big band. Milt Hefflin, 488-5903. Riders needed, van pool, West Loop Park and Ride to NASA. Richard, x37557.

Musical Instruments

Fender Rhodes elec. piano, good cond., \$200. Jim, x30742.

Akai MG 614 6-channel 4 trk. recorder, \$1,125; Yamaha DX11 profess. synthesizer w/case, \$950, cash or trade for a car or truck. 488-0345.

Kramer Focus 1000 prof. guitar w/Tremolo bar, Bartolini pickup and hardcase, new cond., \$450. Charles, x31153 or 481-2940.

Ibanez Pro-Line elec. guitar w/programm. pick-ups, 30 watt prac. amp; Sholtz X100 Rockman, \$700. Richard, 282-4475 or 480-0524.

Kawai elec. organ, solid oak, ex. cond., \$1,500. 332-9585.

Conn trombone, ex. cond. Tony, 280-1564 or 482-4156.

Kawai K1 digital synthesizer, \$575. Mark, 333-4743.

Lost & Found

Found calculator in bldg. 32, April. Matt,

x34630.

Miscellaneous

'84 Nissan 200 SX manual, \$5. 488-3433.
 Bicycle, men's Touring, 3-spd., well-maint., \$50; couch, early American, \$150; recliner/rocker, \$75. Ed, x36250.

New windows, sliding patio doors, light fixtures, wood moldings, and carpet remnants. Don, x38039 or 333-3313.

Soloflex, \$250; Mark King "Parasol" framed art, \$1,500; Macintosh computer, \$1,500; console stereo, \$50; 2 answer phones, \$50/ea. 280-0144.

One gal. hibiscus and althea plants, \$2.50/ea. 482-5226.

Bra-IROCZ, white w/blk. letters, \$50. Sandy, 283-6980 or 486-8198.

Remington Model 740 semi-auto. .30-06, ex. cond., \$250; Canon sure-shot supreme, \$150. Scott, x34614 or 334-2278.

Wind Surf, Alpha 230A w/Alpha sail, ex. cond., BO; weights and bench, BO.; Schwinn Traveler bicycle, great shape, 27", BO. Reza, 480-6440.

Epson elec. typewriter, (8kB and 32kB optional memory cards), \$140, OBO. x38385.

Sear's 19" color T.V., table model, \$95; 2 hall runners, oriental design, \$30 for both; wool area rug, 6' x 9', \$45; 2 lg. sch. lights, \$10/ea.; old wood folding chair, \$15; 2 child's antique chairs, \$25/ea.; undercounter nat. cash reg., old, \$25; 4 overhead ceiling fan motors, \$35; Singer port. sewing machine, \$75. 488-5564.

Answering machine, \$60; file cabinet, 4-drawer, letter-size, \$60; desk w/file drawer, \$80. George, 996-9461.

Two-strip racing roller skates, were \$250, now \$70, sz. 7. x31670.

One B.F. Goodrich all-terrain tire, never used, \$50. 554-2029.

Membership, Westwood Shores Marina Village, Class "A". R.H. Rhodes, 472-6002 or 453-4321.

Matching Kenmore elec. W/D, good cond., \$150 both. 488-8174.

One or two tickets to July 21 gala event. x37762 or 337-3149.

Four Bridgestone mags and Starfire 14" tires, \$160. x35810 or 538-2061.

Sharp DX-110 CD player, ex. cond., \$80, OBO. Paul, x30869 or 333-2806.

Wilson golf clubs, 8 irons, 3 woods, putter, bag and cart, \$130. Bill, x30960.

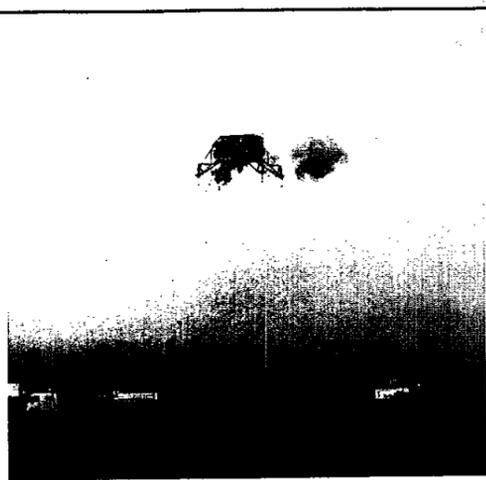
Four Michelin MXL radials, great shape, \$100. Paul, x30869 or 333-2806.

Brush hog, 5', \$300. 482-2493.

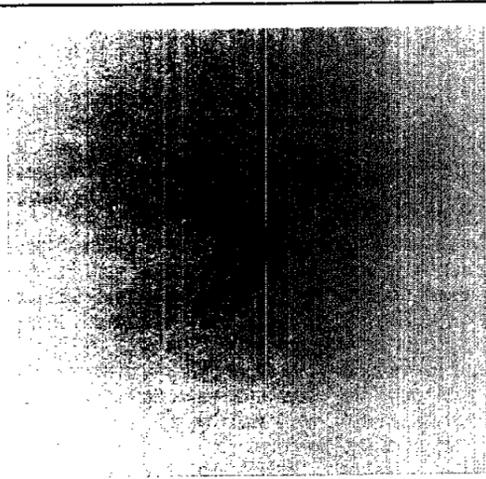
Ajay Octa-gym, assem., \$90; stereo speaker pair, \$45; mini-bike/bicycle carrier, \$15; Plantronics headset, \$45. x31916.

Antiques: Wheelchair, wooden; 2 seed sowers; pedal sewing machine; iron bed; old trunk; chest of drawers; big iron vise and lightning rods; small spinning wheel; "Wonder Woman" telephone, more. 783-9164.

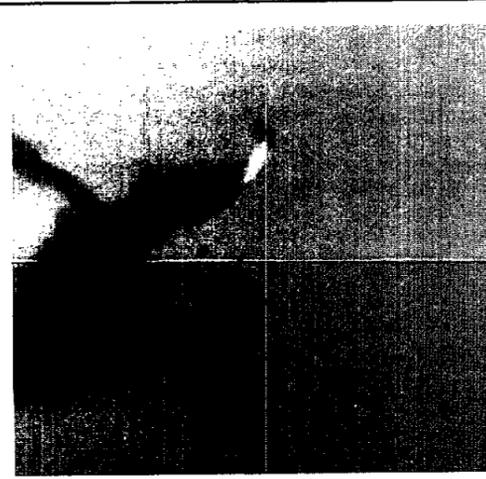
THE RETURN OF A HOMEGROWN R • E • L • I • C



Joe Algranti pilots LLTV No. 3 in 1968 ...



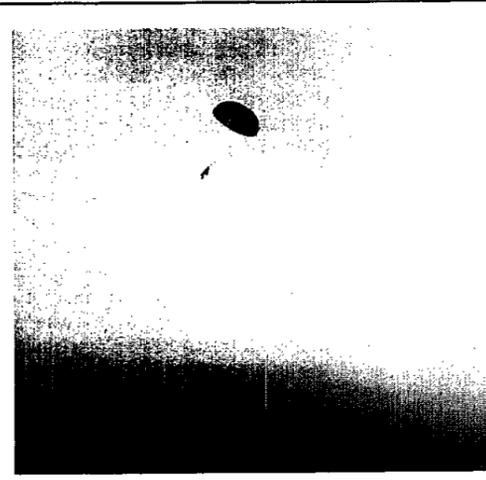
but the vehicle begins to roll uncontrollably ...



Algranti pulls the handle and ejects ...



the LLTV crashes and erupts in a ball of flame



and Algranti floats safely to Earth by parachute.

By Linda Copley

Another "homegrown" relic of the Apollo era—the last of the Lunar Landing Training Vehicles (LLTV)—returned to its place of origin at JSC last week. The ungainly looking flying machine, on display for the past 12 years at the Alabama Space and Rocket Center, is currently stored in Bldg. 9.

Plans call for the 11-foot-tall, 15-foot-wide, 22-foot-long spider-shaped craft to be installed in the Visitors Center on display by mid-July, just in time for the lunar anniversary celebrations.

Moving it into the already-crowded Visitors Center will be no small feat, according to Exhibits Manager Louis Parker. "We'll have to open the glass panels that form the north wall of Bldg. 2," he explained, "and glide it in on rollers under each of the four legs. At the same time we'll be moving the Command Module, already present, about six feet to the west, so the LLTV can be placed between it and the Lunar Module that currently stands next to the information desk.

"Where we're going to put the visitors who normally would be standing in that space is a whole different challenge," Parker said.

LLTV 952, as the craft is officially known, is no stranger to JSC, according to Herb Noakes, an engineering analyst in quality engineering at Ellington Field. Noakes worked as a quality assurance inspector at Ellington during the prime Apollo training years of 1968-73.

"Originally two Lunar Landing Research Vehicles (LLRV) were built by Bell Systems in Buffalo, N.Y. and tested at Edwards in California in preparation for lunar landings," Noakes explained. "The program was then moved to Ellington in 1967, and the LLTV's began being used for training here."

After Astronaut Neil Armstrong had to eject from one of the "flying bedsteads" just seconds before it crashed to the ground in May 1967, however, the remaining LLRV was decommissioned. Modifications made the craft more airworthy. The three resulting LLTV's were delivered to then-Ellington Air Force Base that same year.

Most flights took place in the early mornings or late evenings, to take advantage of the lightest winds possible, according to Noakes. The runway at Ellington was spotted with gray and blue circles, painted to resemble the craters the crews might encounter during an actual lunar landing.

Powered by a jet engine in combination with attitude rockets and lift rockets that ran off of hydrogen peroxide, the LLTV could climb from ground zero to an altitude of about 300 feet, cruise downrange along the runway and choose a site along the crater (circle) to make a simulated lunar landing.

As the pilot entered the lunar simulation, he would initiate an automatic control sequence that retarded the jet engine, which caused the vehicle to experience the one-sixth gravity that would be present during any attempted landing on the

lunar surface.

"We used to say it took 24 hours of preparation for each nine-minute training flight," said Noakes. Prior to the next test, the crews would back through the entire checklist program.

"By the time we were training the crews of the last Apollo missions, we were able to modify the checklist somewhat, since we'd done it so often, and even get up to two or three flights at a time, instead of just one," he said. "And it was really great to hear, every time an Apollo crew returned, that there was no way they could have accomplished the landing without training in the LLTV."

Practice didn't always make perfect, however, as Joe Algranti, chief of aircraft operations, found out in December 1968. "Pilots regularly tested the craft before the crews flew them," explained Noakes, and Algranti was testing LLTV No. 3 for the last time before it was cleared for astronaut training.

Algranti rose to his desired altitude that morning, traveled down the runway about 5,000 feet, and turned the craft around to begin the simulated lunar landing descent. The LLTV began to roll uncontrollably, while the pilot tried, unsuccessfully, to correct each roll with an alternate maneuver.

As the craft was rolling out of control about 90 feet from the ground, Algranti heeded warnings from the ground flight controller to bail out, pulled the ejection seat handle, and shot himself clear. Within three-tenths of a second, the pilot could see the smoking heap of rubble that had been LLTV No. 3, as he parachuted to safety.

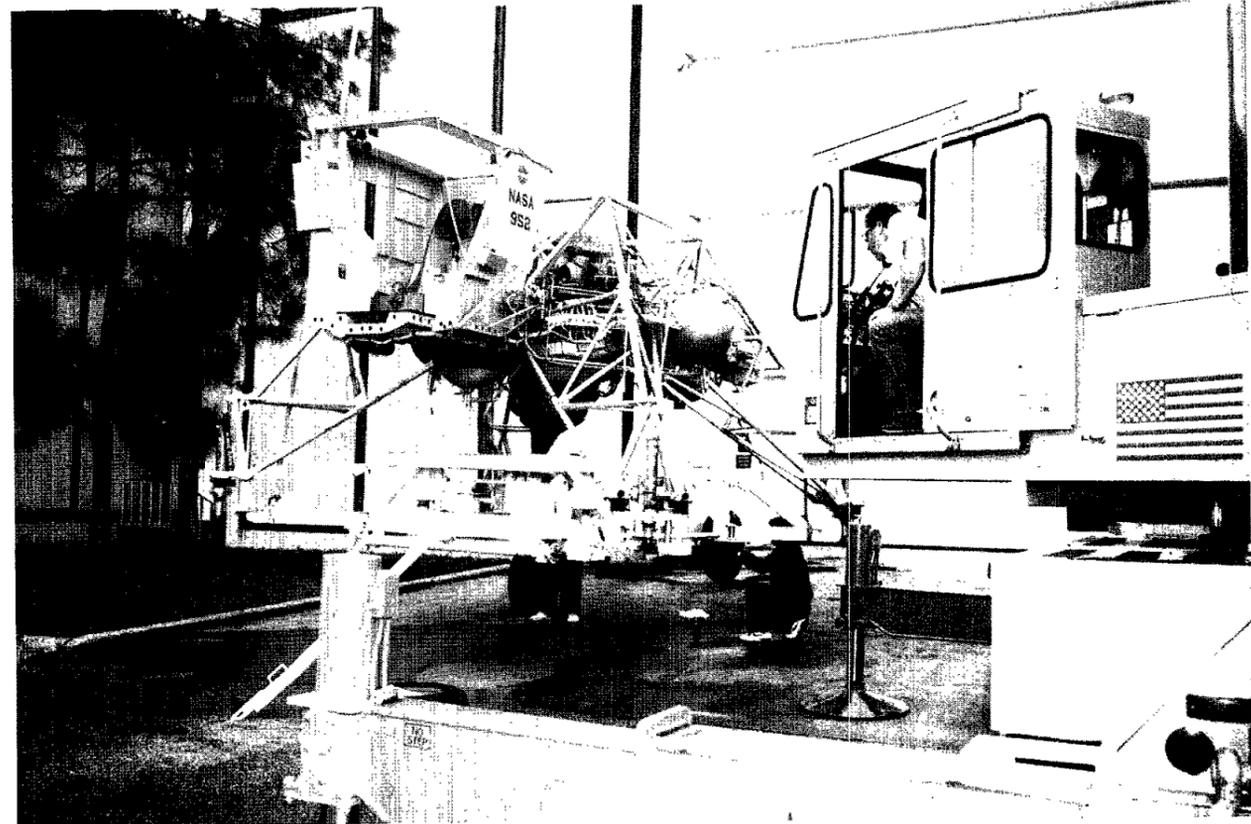
"That ejection seat was designed to lift a man up to 300 feet in the air from ground zero," explained Noakes. "But we all felt less than a second was cutting it a little close."

Modifications, the result of testing in the wind tunnel of Langley Research Center, that removed the cabin roof on the other LLTV's to provide an outlet for trapped air, made the trainer aerodynamically safe again, and the program continued.

All seven Apollo crews trained successfully in the remaining LLTV's, despite another crash in 1971 by Staff Pilot Stuart Present which was attributed to a loss of electrical power. Present successfully ejected prior to the crash, but was later killed practicing the beginning phases of orbital descent while flying a modified T-38 near Matagorda Island, Texas, on January 20, 1972.

Noakes, who witnessed all the successful LLTV test flights, as well as the crashes, is elated the craft is back at the center. And he plans to prove it, by volunteering to stand next to the lone survivor during JSC's Open House lunar anniversary weekend, July 22-23, and brief the crowds on the part it played in America's quest of lunar exploration.

"It's a real JSC product," he says. "It was built here, tested here, and the Apollo crews trained in it here. This is where it belongs."



JSC Photo by Bill Blunck

Lunar Landing Training Vehicle 952 is lifted by a crane as workers prepare to place it inside Bldg. 9 for temporary storage. The trainer, which will be on permanent display at JSC, will be moved into the Visitors Center before Apollo anniversary activities begin.

High school apprentices learn and earn at JSC

Ten talented high school students have been hired to participate in an eight-week intensive science and engineering apprenticeship program at JSC this summer.

The program, called the Summer High School Apprentice Research Program (SHARP), is sponsored by NASA's Educational Affairs Division and participating centers. It is designed for high school students

who have demonstrated an aptitude for and interest in science and engineering careers.

"As apprentices, the students learn and earn," said Howard Bruce, SHARP coordinator. "They participate in an orientation process that provides them with an overview of the center's mission and the activities necessary to accomplish the center's goals and objectives."

During the apprenticeship, the students complete assignments, prepare written reports, make oral presentations and participate in a variety of enrichment activities under the supervision of the SHARP program staff and assigned mentors, Bruce said.

SHARP is a feeder program that is being used to build a resource pool of potential applicants for

science and engineering jobs, he added, and provides students with first-hand experience and information that will help them make career decisions. It is specifically designed to attract and serve minorities who are underrepresented in the science and engineering workforce.

This year's JSC SHARP participants are Tony Peng from Nimitz

High School, Meena Sundaresan from Pearland High School, Tran (Jen) Tran from Clear Creek High School, Scott Hulin from Dobie High School, Paul Haun and Michael Rashid from Clear Lake High School, and Alicia Contreras, Burl Gilmore, Autumn Simon and Marcel Moran from Booker T. Washington and the High School for the Engineering Professions.

Parade plans

(Continued from Page 1)

information on entering should call Sandy Wilkenson at 333-3914.

Community groups and businesses are also encouraged to take part in the festivities. The Outpost, J. Larkins, Tindy's, Applebees, Alpha Builders, the Jalapeno Tree, Edward White Memorial Center and the Lunar Rendezvous Festival are a sampling of the local groups planning to appear. Community organizations wishing to enter a float should contact Celeste Wilson, at 282-1820.

As they enter the main gate (all other gates will be closed) visitors will be given American flags, courtesy of Channel 11, and free commemorative posters, from 94.5 Oldies, a local radio station. Free Pepsi will be available, thanks to station 104 KRBE, and free Borden's ice cream will be available, due to KPRC-TV, which will be featuring Elsie the Cow on its float. Radio Station KHYP will provide a 40-member drill team for the event, and 950-KPRC AM will also participate and provide coverage.

The rally in Rocket Park will be emceed by Channel 11's Steve Smith. The 30-minute event will feature a presentation to Astronaut Office Chief Dan Brandenstein. Buzz Aldrin also will also make a presentation to Remy Volson, winner of the Channel 11 essay contest on "Why Should Men Return to the Moon?" The contest was open to local students in second through 12th grade.

STS-28 readied

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continue processing in the OPF for its next flight scheduled for November.

In the remaining OPF, *Atlantis* continues powered up work for NASA's second Shuttle planetary launch in October. STS-34 will carry the Galileo probe which will be deployed toward an encounter with Jupiter in the mid-1990s.

Current plans are to launch *Discovery* on STS-33 from the refurbished launch complex 39A. That shuttle launch pad has not been used since mission STS-61C in January 1986. Pad 39B will be taken out of the flow following STS-32 in December for refurbishment.



MacKenzie Shelton does some of her own flying with the help of a swing and her father, Mark.

Letter unlocks mystery

Family explains why it sends flowers

A family of NASA admirers that has been rather mysteriously sending flowers to the Mission Control Center during each mission has shed some light on its reasons.

Milt Heflin, lead flight director for STS-30, sent a thank you note to the family after the mission was over, and in return received photographs and a letter explaining the gifts. "I found the letter very heartwarming and a reminder of the supporting general public," Heflin said.

The roses and the letter come from Mark, Terry and MacKenzie Shelton, who live in Bedford, Texas, near Dallas. Since STS-26, the Sheltons have sent roses to the MCC each mission. Their letter explains why:

"NASA and her projects and missions have always been a source of hope, pride and inspiration to the people of the United States and,

more importantly, to the people all over the world. We all know the dedication of all of you associated with the space program to the successful completion of each mission and to the safety of those whose lives are in your hands," they wrote.

"We send flowers each time because we care that y'all care. Each arrangement has a rose representing each member of that particular flight crew, and another that represents those who have given their lives for us to have the opportunity to continue our lives and missions. I am so grateful for the things that have come out of the space program which help our lives and those of our children. My daughter, MacKenzie, is most important in our lives, and we are grateful for what y'all do to improve the quality of her life."

Legal changes intensify need for prompt payment

Recent revisions to the Prompt Payment Act have made it even more important for JSC employees involved in paying invoices to expedite the process.

The amendments, which became effective April 1, have made it crucial that invoices or vouchers are not held before sending them to the Financial Management Division for payment.

Any amount of time that an invoice or voucher is held must now be counted in the strict, 30-day payment period, and delays will result in the levying of interest penalties. A list of some of the more important revisions follows:

- The 15-day grace period has been eliminated.

- Acceptance is considered to have been made on the seventh day after: the delivery of goods or performance of service; the date of acceptance (if acceptance occurred before the seventh day after delivery of goods or performance of service); or, at the conclusion of a longer acceptance period if specified in the solicitation and included in the contract.

- The date of receipt, used to determine the payment due date, must be the date the invoice was first

received by the person or place designated in the contract.

- Agencies are required to pay interest penalties, even if prevented from paying on time by temporary unavailability of funds.

- Construction contract progress payments must be paid in full within 14 days after the agency first receives a payment request from the contractor.

- Agencies must review all invoices and return defective ones to the contractor within seven days after receipt.

According to the new legislation, the discount period must be counted from the date placed on the invoice by the contractor.

In addition, as of Oct. 1, an additional penalty will be required from an agency that owes a late payment penalty and fails to pay it within 10 days after making the late payment, and if the contractor makes a written request no later than 40 days after the date of the subsequent payment. Utility bills are not included in this revision.

For more information regarding the Prompt Payment Act or any of its subsequent revisions, contact Deborah Conder, x32197.

Retiree Service Center marks first anniversary of operation

The National Association of Retired Federal Employees (NARFE) Retiree Service Center recently celebrated its first year of operation at JSC.

Burney Goodwin said the center provides a place where federal retirees may find answers to questions about their health benefits, insurance, annuities and other issues.

The center serves not only retirees, but their families and survivors as

well. Goodwin said many different types of problems have been encountered since the center opened in June 1988, and that calls have been received from as far away as California and Pennsylvania.

Located in Bldg. 45, Rm. 140, the center is open each Thursday from 10 a.m. to 2 p.m. Telephone calls are accepted during work days at 483-3091, and are returned on Thursdays.

Experiments chosen for Space Station Freedom

(Continued from Page 1)

be built for *Freedom*. These are Astromag, a cryogenically-cooled superconducting electromagnet to measure cosmic rays and the Cosmic Dust Collection Facility, which will capture and record the direction and velocity of cosmic dust particles for further analysis.

The 27 selections were made from responses to two NASA announcements of opportunity issued in 1988. The first, issued in January, was for the Earth Observing System (EOS) and solicited proposals for both the unmanned NASA Polar Orbiting Platform and the permanently manned space station. The second was issued in July and was specifically for scientific and technological payloads in other scientific disciplines to be attached to *Freedom*.

The investigations include participants from about 50 organizations representing NASA and other government and private research centers, U.S. universities and five foreign countries.

Selection of the flight experiments was predicated on their ability to meet a timetable for the design, development and assembly of *Freedom* elements. The earliest expected flight date for any of the experiments is 1996.

The following individuals have been

selected for funding for experiments:

Dr. Robert M. Walker, McDonnell Center for the Space Sciences, Washington University, St. Louis, Cosmic Dust Experiment.

Dr. Michael Fitzmaurice, Goddard Space Flight Center, Laser Communications Transceiver.

Dr. Paul Gorenstein, Smithsonian Astrophysical Observatory, Cambridge, Mass., Large Area Modular Array of Reflectors/High Throughput X-Ray Astronomy Instrument.

Dr. Thomas A. Parnell, Marshall Space Flight Center, Spectra, Composition and Interactions of Nuclei above 10 TeV, Astromag experiment.

Dr. Jonathan F. Ormes, Goddard, Large Isotope Spectrometer for Astromag.

Dr. Glenn C. Carle, Ames Research Center, Exobiology Intact Capture Experiment.

Dr. Siegfried Auer, Applied Research Corporation, Landover, Md., Cosmic Dust Orbit and Capture Experiment.

Dr. Robert L. Golden, New Mexico State University, Las Cruces, Measurement of Cosmic Rays including Antiprotons, Positrons, Anti-nuclei and a Search for Primordial Antimatter, Astromag experiment.

Dr. Arthur B. Walker, Jr., Stanford University, Calif., Ultra-High Resolution

XUV Spectroheliograph.

Dr. W. T. Sanders, University of Wisconsin at Madison, X-ray Background Survey Spectrometer.

Dr. Peter B. Price, University of California at Berkeley, Heavy Nucleus Collector.

Dr. M. Patrick McCormick, Langley Research Center, Stratospheric Aerosol and Gas Experiment III.

Dr. Hugh Christian, Marshall, Lightning Imaging Sensor.

Dr. Bruce Barkstrom, Langley, Clouds and the Earth's Radiant Energy System.

The following scientists have been selected for funding for concept studies:

Dr. Peter M. Banks, Stanford University, Calif., Plasma Interactions Experiment.

Dr. Michael Shao, Optical Sciences and Applications Section, Jet Propulsion Laboratory, Orbiting Stellar Interferometer.

Dr. Robert D. Reasenberg, Smithsonian Astrophysical Observatory, Precision Optical Interferometry in Space Study.

Dr. Jonathan E. Grindlay, Harvard-Smithsonian Center for Astrophysics, Energetic X-ray Observatory for Space Station.

Dr. Robert L. Brown, National Radio Astronomy Observatory, Charlot-

tesville, Va., High-Resolution Imaging Spectroscopy at Tera Hertz Frequencies.

Dr. Hugh S. Hudson, University of California, San Diego, Pinhole/Occulter Facility.

Dr. Guy Fogleman, SETI Institute, Ames Research Center, Study to Develop an Active Collector of Cosmic Dust.

Dr. William L. Barnes, Goddard, Tropical Region Imaging Spectrometer.

Dr. Michael H. Freilach, Jet Propulsion Laboratory, Advanced Scatterometer for Studies in Meteorology and Oceanography.

Dr. Tiruvalam Krishnamurti, Florida State University, Tallahassee, an experiment similar to the Laser Atmospheric Wind Sounder, one of six facility instruments included in the Polar Platform proposal.

Dr. William G. Melbourne, Jet Propulsion Laboratory, Global Positioning System Geoscience Instrument.

Dr. Gerald R. North, Texas A&M University, College Station, Tropical Rain Mapping Radar.

Dr. Roy Spencer, Marshall, Tropical Geophysical Information Retrieval with a High Resolution Microwave Spectrometer Sounder

Space News Roundup

The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every Friday by the Public Affairs Office for all space center employees.

Moon visitors to speak

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hours sampling and surveying the dusty lunar terrain, including an encounter with Surveyor III, the lunar probe that had landed there two and a half years before. Surprisingly, though, the memory most lingering with Bean today is not from the surface at all.

"The image that sticks with me is not one from the surface, but from lunar orbit through a tiny window in the LM (lunar module). You could see the entire curvature and realize the relatively small diameter of the Moon. It seemed almost like science fiction to be in orbit around this small ball!"

The presentation will be the last in a series at the Teague Auditorium. The event, which begins at noon, is free and open to the public.